



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re Patent Application of

TULLOCH et al

Atty. Ref.: 540-161

Serial No. 09/437,226

Group: 2829

Filed: November 10, 1999

Examiner: P. Patel

For: THERMOGRAPHIC WIRING INSPECTION

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November 25, 2003

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REPLY BRIEF

This Reply Brief is responsive to the Examiner's Answer mailed September 25, 2003 (Paper No. 16) in the above-identified appeal. Specifically, this Reply Brief is responsive to the multitude of new points of argument and/or changing admissions presented by the Examiner in the Examiner's Answer as compared to the last Official Action.

In the discussion of appellants' Appeal Brief, the Examiner suggests that the Summary of the Invention portion "failed to define claims involved in the appeal." Appellants observe that the Summary of the Invention includes at the end, and in bold, actually quotes from appellants' independent claim, and it is noted that appellants have

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pointed out that the rejected claims stand or fall together. Therefore, appellants' Summary of the Invention does indeed define the claims involved in the appeal.

A brief discussion of some of the new points of argument follow:

1. The Preamble Does Comprise A Portion Of A Claim

In the Examiner's initial argument, he alleges that "a preamble generally does not distinguishes [sic] a claim over prior art" citing case law which is 25 and 50 years old, respectively, from the Court of Customs and Patent Appeals.

However, the Examiner fails to cite any of the more recent Federal Circuit cases, such as *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 34 USPQ2d 1816, 1820 (Fed. Cir. 1995) in which the Court held that "[A] claim preamble has the import that the claim as a whole suggests for it" or "If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give life, meaning and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes, Inc. v. Hewlett-Packard Company*, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999).

Moreover, it is noted that the above precedent is specifically set out in the Manual of Patent Examining Procedure (MPEP) Section 2111.02. Thus, the Examiner's misunderstanding of the consequence and effect of the "inspecting" portion of appellants' claim 1 preamble is perhaps understandable. Appellants' claim recites three steps which together comprise a method for inspecting the integrity of insulation of an insulated wire. While the three steps could be possibly combined to accomplish other tasks, appellants have combined them in a method for inspection. The word "inspect" means "to view

closely in critical appraisal" as defined in *Webster's Ninth New Collegiate Dictionary* at page 626.

The Examiner does not appear to appreciate that the Cahill reference does not perform any inspection with respect to the integrity of insulation (because the defects in the insulation, i.e. the notches cut in the insulation, have been intentionally provided at known locations). The whole point of the Cahill disclosure is to intentionally provide defects in wire insulation and then observe the effect of those defects under long-term exposure to electrolyte fluid and current flow.

Thus, the Examiner has improperly ignored the "inspection" claim language which clearly distinguishes over the cited prior art.

2. The Examiner misunderstands the Cahill TGA disclosed in Figures 15-17

The Examiner also confuses the figures which show the wires after the testing has been completed (including melted and/or burned insulation) and the thermogravimetric analysis (TGA) in Figures 15-17.

TGA is a well-known analysis method by which a material is heated through increasing temperatures and the amount of mass lost as the temperature increases is measured. TGA is not a method of looking at or inspecting insulation during the shorting process. Indeed, TGA would normally be accomplished by removing the wire and using only a sample of the insulation in a furnace. Thus, Cahill has nothing to do with inspecting integrity of insulation, since the insulation is already and intentionally non-integral.

3. Examiner attempts to change his previous admission

The Examiner again alleges in the sentence bridging pages 7 and 8 of the Examiner's Answer that Cahill has the step of "detecting the intensity of heat emanating from said wire or cable." This is a 180° change from the Examiner's prior admission in the Official Action mailed September 13, 2002 that "Cahill does not explicitly disclose, using a thermal imaging system to detect and display the intensity of heat emanating from said wire or cable."

Moreover, the Examiner can point to no portion of the Cahill reference in which the intensity of heat emanating from the wire or cable is disclosed, observed or imaged. Cahill merely provides enough electrolytes so as to establish a current flow and then allows that current flow to continue until the insulation deteriorates and the wire shorts with an adjacent wire and records the time from the initiation until the short. As a separate part of the Cahill reference, Cahill also performs TGA on various insulation materials to determine which ones last the longest. There is no detection and/or displaying of the intensity of heat emanating from the wire or cable, which is specifically recited in appellants' third method step of "using a thermal imaging system." The Examiner simply misunderstands what is shown and not shown in the Cahill reference.

4. The Examiner misunderstands Cahill

In the last paragraph on page 8 of the Examiner's Answer, the Examiner alleges that Cahill teaches "in fig. 15-17 (measurement of temperature) a detection of heat

intensity (temperature) for inspecting the insulation of wire." As noted briefly above, Figures 15-17 in the Cahill reference, as also can be seen on page iv of Cahill, are TGA or thermogravimetric analysis of "Kapton," "Teflon" and "ETFE." The term TGA is defined on page v as "mass loss versus temperature" and is a process for gradually heating a polymer and measuring the mass loss at various increasing temperatures.

The above contention is born out by actually examining Figures 15-17 which show that, as the temperature of the sample initially increases, there is very little weight loss until some temperature is reached at which the decomposition of the plastic material occurs and then a good portion of the mass of the sample is lost, with the remainder being the charred residue. TGA is the change in mass over increasing temperature.

Based upon the TGA disclosed in Figure 15-17, the Examiner non-sensically concludes that Cahill discloses "detection of this temperature in fig. 15-17" (end of first paragraph on page 9). The Examiner then uses this mistaken understanding to suggest that Cahill needs thermal measurement during his testing of wire bundles. Again, a reading of Cahill will show that the wire bundle testing is separate from the TGA and the one does not suggest the other. The Examiner points to no disclosure in Cahill in which there is any temperature measurement of the wire bundles during the long duration testing which is disclosed in the various test sample summaries discussed in Tables 1-4. Of course, this is because Cahill has no need for thermal measurement during the initial tests. The Examiner has previously been challenged to point to some portion of Cahill which discloses appellants' claimed third step, or indeed has any motivation for thermal

imaging of the wire bundles during any test, and has failed to provide any indication of this being taught or shown or disclosed in the Cahill reference.

5. No basis for the Cahill/Ogura combination

In the first full paragraph on page 9, the Examiner suggests that Cahill's visible photographs of the wire bundles somehow renders it obvious to use Ogura's thermal imaging system. The Examiner forgets, of course, that with respect to Figures 3-14, the test had already been completed, and these figures are visible photographs of the resulting bundles after test, not during the test (and so the bundles could still be warm or cold, depending upon how quickly after the test was completed that the photographs were taken). In fact, using the Examiner's rationale, Cahill would lead one of ordinary skill in the art to taking visible pictures after the test, rather than thermal images during the test.

Finally, the Examiner's statement that he concludes "that combination is obvious for the purpose of identifying flows [sic] and defects in the insulation from a temperature distribution on a surface of the insulation." Because Cahill knows which wires have had their insulation removed and where that insulation removal is, there is no need to inspect in order to determine where there is a defect in insulation. Even if Ogura were combined and utilized during the Cahill test, Ogura's thermal imaging presumably would confirm the location of the existing defects in the insulation. Therefore, one of ordinary skill in the art would have no motivation for using Ogura's thermal image, because it would merely teach what is already known to the tester, i.e. the existing location of insulation defects.

6. The fact of a benefit provided by an invention does not evidence that the combination of elements resulting in the invention would be obvious

The Examiner admits that his conclusion as to the combination being obvious is for the reason which the invention exists, i.e. identifying existing defects in the insulation. However, the Examiner fails to point out how or where either Cahill or Ogura have any bearing on any attempt to inspect wiring for the purpose of determining integrity of insulation. Thus, the Examiner is using the benefit of the present invention (totally undisclosed in both prior art references) as a reason for combining the references. Of course, this is the reason for all inventions, i.e. the beneficial result is the reason why those elements are combined. This is not the test for obviousness which is set out in the Appeal Brief in detail. Using the Examiner's reasoning, everything would be obvious if one merely takes the periodic table and combines the elements in the manner necessary to achieve the desired benefit of the combination. This rationale and analysis by the Examiner is simply not the test of §103 and ignores the contrary teachings of both Cahill and Ogura.

7. Ogura teaches the opposite of defects in insulation

The Examiner states that Ogura teaches use of a thermal image system "to display images of defects in the insulation." Actually, if one reads the Ogura reference, it will be found that Ogura is used to show defects in conductivity (not insulation) of carbon fibers making up a CFRP panel.

In fact, the caption to Figure 3 discusses thermal images for the CFRP (carbon fiber reinforced plastic) sample showing the temperature field at damaged portions of the carbon fiber. The label under the two portions of Figure 3 indicates 3 and 8 seconds, respectively, after initial current application. Reviewing the text to the left of Figure 3, it can be seen that there is a temperature rise at the areas where the carbon fibers have been damaged and thus current flow is not evenly carried from left to right across the carbon fiber fabric. Where the carbon fiber is interrupted, there is a defect in the conductivity of those carbon fibers and the heat is generated when the current has to find another source around the damaged fibers.

Thus, the Examiner's conclusion as to what is seen in the Ogura reference is simply 180° out of phase with reality.

8. The Examiner incorrectly suggests that the Ogura reference is to detect "flaws and defect [sic] in insulation"

In the paragraph bridging pages 10 and 11 of the Examiner's Answer, the Examiner states that "it is also true that Ogura reference uses thermal imaging system to detect flaws and defect in **insulation**" (emphasis added). There is no insulation present in the CFRP panel or sample used in the Ogura reference.

Moreover, the thermal imaging does not indicate a flaw or defect in insulation, but rather a flaw or defect in conductivity of the carbon fibers, which is just the opposite of insulation. The Examiner's continued misunderstanding of the Ogura reference is carried over to page 11, the first full paragraph, where the Examiner states that "Ogura teaches a

method for providing pictures of insulations [sic]." Ogura provides thermal images of defects in the conductivity of carbon fibers making up a CFRP panel.

9. Marquez-Lucero teaches use of an oscilloscope

The Examiner suggests, in the paragraph bridging pages 11 and 12, that the sole reason for combining the Marquez-Lucero reference with the Cahill/Ogura combination is that Marquez-Lucero teaches the use of an oscilloscope. The Examiner does not dispute that Marquez-Lucero has nothing to do with any method for inspecting the integrity of insulation of an insulated wire or cable. The Examiner does not dispute that it has nothing to do with the step of passing current through a wire or the step of applying a fluid having electrolytic properties to a wire. The Examiner does not dispute that it has nothing to do with using a thermal imaging system to detect or display the intensity of heat emanating from a wire.

The sole reason for the Examiner's combination of Marquez-Lucero with the Cahill/Ogura combination is that one can measure current with an oscilloscope. This is simply no reason for combining the Marquez-Lucero reference with the Cahill/Ogura combination in that there is no reason or motivation for such combination. There is no indication by the Examiner that the cited references have any relation to the problem being solved by the claimed invention, i.e. the inspection of the integrity of insulation of an insulated wire or cable. As a result, Marquez-Lucero is simply not combinable with the Cahill/Ogura combination.

10. The Piety Reference Is Unrelated To Any Process For Inspecting Wires

The Examiner's admission that he "agrees with Appellant's assertion above" in the Examiner's Answer on page 12 is very much appreciated, because the appellants' assertions are that the Piety reference does not teach (1) any method for inspecting integrity of insulation, (2) the step of passage of current through the wire or cable under test, (3) the step of application of fluid having electrolyte property, (4) nor the use of a thermal imaging system for detection and display of heat emanating from the wire or cable.

Apparently the Examiner's sole basis for citing the Piety reference is that it stores and processes thermal images in its digital video data recorder. Again, the Examiner fails to supply any motivation (this issue having previously been raised in appellants' Brief) for combining Piety with any other reference. The Examiner's recitation of *In re Keller* does not obviate the requirement of the Court of Appeals for the Federal Circuit for the Examiner to provide some reason or basis for combining references. There must be some motivation somewhere for combination to exist. Otherwise, every new invention would clearly be an obvious combination of what has gone before, because it is comprised of known parts (even new compounds or materials are made up of known parts). The Examiner fails to provide any support for his combination of references.

CONCLUSION

The Examiner's current contention that the Cahill reference now discloses a step of inspecting integrity of wire or cable during the course of the Cahill test is a direct change from the Examiner's previous admissions that Cahill failed to teach any such detection or

display. Of course, Cahill has no inspection or detection during the course of his tests, nor does he teach displaying any thermal image of the results. Thus, the Examiner's contention that all claimed steps are met by Cahill is simply incorrect.

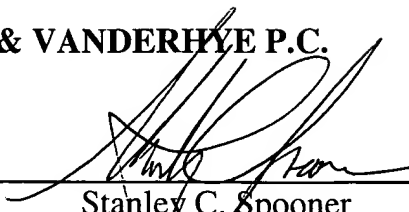
The Examiner misapprehends the teaching of the Ogura reference, as it has nothing to do with insulation and everything to do with continuity and conductivity of the carbon fibers under test. The Examiner has failed to supply or indicate that any of the prior art references recognize the problem solved by the present combination of method steps, nor has the Examiner provided any reason for combining the references, other than the beneficial result disclosed in appellants' own patent application.

Thus, and in view of the above, and the Appeal Brief as originally filed on June 26, 2002 and the subsequent Appeal Brief to another non-Final action as filed on April 11, 2003, the rejection of claims 1-25 over the prior art combinations is clearly a hindsight combination and is in error and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

NIXON & VANDERHYTE P.C.

By: _____


Stanley C. Spooner
Reg. No. 27,393

SCS:kmm
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

Enclosure:

Page 626 *Webster's Ninth New Collegiate Dictionary*